

REMARKS

Claims 1 and 13 are amended. Claims 18-21 are canceled. Claims 65-68 are added. Claims 1-8, 10-17 and 22-68 are in the application for consideration.

The Examiner asserts that MPEP 201.11(III)(A) enables an Examiner to rely upon the published U.S. Patent No. 7,098,131 as prior art. The Examiner is mistaken. Section 201.11 of the MPEP is only interpreted to refer to instances and manners by which an Applicant can and must claim priority to an earlier filed application if the Applicant so chooses. The undersigned finds absolutely nothing in the MPEP section upon which the Examiner relies which enables an Examiner to rely upon language in another patent application as prior art where that application arrived at the Patent Office on a date after the application which is being examined. If the Examiner is to persist in this regard, it is respectfully requested that the Examiner refer to specific language in the MPEP which enables an Examiner to assert as prior art something only having an effective filing date which is after that of the application being examined.

Again, Applicant acknowledges that the Examiner is empowered under the present record to rely upon U.S. Patent Application Serial No. 10/196,814 as prior art, but not language appearing in U.S. Patent No. 7,098,131 that does not also appear in the '814 application.

In Section 5 of the February 9, 2007 Office Action, the Examiner rejects independent claim 17 as being obvious over U.S. Patent No.

7,098,131 to Kang et al. It is the Examiner's assertion that such at col.6, Ins.58+ and col.8, Ins.15-25 disclose instances where a plasma is not utilized. However, the language upon which the Examiner relies is not found in the '814 patent application. Therefore, the language upon which the Examiner relies is not prior art, and the Examiner is precluded from relying upon such.

Claim 17 requires feeding of the second precursor to the chamber in the absence of plasma during the chemisorbing. The '814 Kang et al. reference is completely silent in this regard, and there is absolutely no suggestion of doing what Applicant recites in claim 17.

Further, Applicant's independent claim 17 inherently requires feeding second precursor to the chamber with the first precursor during the chemisorbing, and as well requires contacting the chemisorbed first species with a second precursor plasma. Thereby as a minimum, both a combination first and second precursor flowing is required during the chemisorbing, and a contacting with the second precursor plasma thereafter. Even were the language upon which the Examiner relies in '131 Kang et al. prior art (which it is clearly not), the '131 Kang et al. patent does not disclose or suggest both flowing first and second precursors during Applicant's claim-recited act of chemisorbing, followed by contacting with the second precursor plasma.

Applicant's claim 17 should be allowed as asserted above, and action to that end is requested.

Independent claim 29 is also listed as being rejected as being obvious over Kang et al. '131 in Section 5 of the February 9, 2007 Office Action. Yet, Section 5 of the February 9, 2007 Office Action in no way refers to language appearing in claim 29 which Applicant asserted in its last-filed Office Action Response makes such allowable over Kang et al. '814. Accordingly, the undersigned is left guessing as to why the Examiner still rejects independent claim 29 as the Examiner has not countered Applicant's previously submitted argument.

Specifically, claim 29 requires that metal atoms be present in the conductive metal nitride at an atomic ratio of metal atoms to nitrogen atoms at greater than 1:1. Such is neither shown nor suggested in the '814 application, and in fact the exact opposite is suggested. Specifically, the undersigned does not find any locations within the '814 reference where specific content of metal atoms to nitrogen atoms is provided, with the disclosed stoichiometry only being shown as 1:1. Further, even the '131 Kang et al. patent (which is not prior art) in Table 1 discloses greater nitrogen content as compared to the metal in a tantalum nitride layer. Also, the '814 Kang et al. reference at p.7, ln.31 – p.8, ln.10 indicates that nitrogen atoms are not affected by the removal gas due to double bonding with the elemental metal. Thereby, the '814 Kang et al. reference clearly teaches away from formation of a metal nitride layer having greater metal content than nitrogen content. Accordingly, Applicant's claim 29 should be allowed, and action to that end is requested. If the Examiner is of a

different opinion, it is respectfully requested that the Examiner so state, including rationale for such opinion on the written record.

Section 6 of the Office Action of February 9, 2007 rejects independent claims 18, 26, and 36 over a combination of '131 Kang et al. with U.S. Patent No. 7,067,420 to Choi et al. However, the language in Section 6 of the February 9, 2007 Office Action only appears pertinent to language appearing in independent claim 18 (which has been canceled), with no rationale being provided as to why the combination of Kang et al. and Choi et al. renders either of independent claims 26 and 36 unpatentable. Again, the undersigned asserts that '131 Kang et al. cannot be relied upon by the Examiner as prior art, but that the Examiner is empowered based on the record to rely upon '814 to Kang et al. as being prior art.

Specifically, claim 26 recites that pressure within the chamber during the chemisorbing is lower than during the contacting. The '814 Kang et al. reference clearly only teaches that its process is carried out at a constant pressure (p.6, Ins.25, 26). The undersigned finds no reference in Choi et al. to utilizing multiple different pressures, let alone a chemisorbing pressure that is lower than a contacting pressure in the context of Applicant's independent claim 26. Accordingly, Choi et al. does not cure the deficiency of the '814 Kang et al. reference, and Applicant's independent claim 26 recites a combination of elements not encompassed by the combination of '814 to Kang et al. and '420 to Choi et al. Accordingly, as the Examiner has not provided specific rationale as to why he feels claim 26 is obvious over a

combination of Kang et al. and Choi et al., the undersigned is left guessing and cannot otherwise or more fully respond to the assertion of obviousness made.

The Examiner previously asserted with respect to “constant pressure”, that such is a well-known result-effective variable and that Applicant must show unexpected results garnered from the variable. Without necessarily agreeing to the Examiner’s previous assertion, Applicant indicated that paragraph [0024] indicates that best conductivity results were obtained where pressure during the chemisorbing with the first precursor is lower than it is during the contacting with the second precursor. There is absolutely no disclosure or suggestion that a pressure change would result in optimization of conductivity, and accordingly Applicant does show unexpected results obtained from the stated pressure relationship, although obtaining such improved conductivity is in no way required by claim 26. For the foregoing reasons, Applicant’s independent claim 26 should be allowed, and action to that end is requested.

Independent claim 36 is also rejected over a combination of Kang et al. and Choi et al. in Section 6 of the February 9, 2007 Office Action. Claim 36, among other limitations, includes that the second precursor plasma is generated from feeding the second precursor to the deposition chamber with plasma power being applied to the second precursor within the deposition chamber. Claim 36 also requires that plasma power be started prior to feeding the second precursor to the deposition chamber,

continued while feeding the second precursor to the deposition chamber, and continued after stopping feeding of the second precursor to the deposition chamber. Under no conceivable stretch of the imagination do either Kang et al. or Choi et al. in any way remotely refer to or imply any such application of plasma power. Accordingly, *prima facie* obviousness has not been made out with respect to rejection of Applicant's claim 36, and regardless the obviousness rejection thereover should be withdrawn. Action to that end is requested.

Independent claim 13 stands rejected as being obvious over a combination of '131 Kang et al. with U.S. Patent No. 6,576,053 to Kim et al. Applicant again reasserts that '131 to Kang et al. is not prior art. Yet, the Examiner is empowered on the present record to rely upon the '814 Kang et al. application as prior art.

Claim 13 has been amended to recite that the contacting of the chemisorbed first species of the monolayer with a second precursor plasma comprising CO is effective to react with the first species to remove organic groups from the first species of the monolayer without incorporating oxygen from the CO into the monolayer. Such is clearly supported in Applicant's application as-filed at least in the figures, for example in Fig. 3 wherein exposure to a P₂ plasma is disclosed to remove the "R" of Fig. 2, thereby showing not incorporating or adding O of a CO P₂ precursor plasma into the monolayer. Clearly, Kim et al. only teaches incorporation of oxygen into its monolayer as an oxide is what is being formed. Under no stretch of the

imagination could Kim et al. teach or suggest utilizing CO to remove organic groups from a monolayer without also incorporating oxygen into the monolayer. The '814 Kang et al. reference does not cure this deficiency of Kim et al. as no oxygen-containing second precursor plasma is remotely suggested in the '814 Kang et al. reference. Accordingly, Applicant's amended claim 13 recites something which is not disclosed in either of the '814 Kang et al. reference nor the '053 Kim et al. patent. Accordingly, the Examiner's obviousness rejection thereover should be withdrawn, and action to that end is requested.

Independent claim 1 also stands rejected as being obvious over a combination of '131 Kang et al. with '053 Kim et al. Again, Applicant asserts that the '814 Kang et al. application may be relied upon as prior art based upon the present record, but that the '131 Kang et al. reference cannot.

Claim 1 has been amended to recite the contacting of the chemisorbed first species of the monolayer with a second precursor plasma effective to react with the first species to remove organic groups from the first species of the monolayer without incorporating any component of the second precursor plasma into the monolayer. Such is clearly supported in Applicant's application as-filed at least in the figures, for example in Fig. 3 wherein exposure to a P₂ plasma is disclosed to remove the "R" of Fig. 2, thereby showing not incorporating or adding any component of the P₂ precursor plasma into the monolayer.

With respect to Kim et al., such is interpreted to utilize oxygen containing second precursors wherein oxygen is always incorporated into the monolayer. Accordingly, Applicant's amended claim 1 recites something which is not taught by the '053 Kim et al. patent.


Regarding Kang et al., such everywhere discloses a second precursor plasma which comprises hydrogen, which is contrary to Applicant's claim 1. Accordingly, Applicant's amended claim 1 recites something which is not found in either of '814 Kang et al. or Kim et al., and the obviousness rejection thereover must be withdrawn. Action to that end is requested.

Dependent claim 65-68 are added. Support for Applicant's added dependent claim 65 can be found in paragraph [0019]. The art of record is not in any way seen to disclose or suggest using either of the stated compounds in a second precursor plasma. Regarding claim 66, support for the same can be found in Applicant's specification as-filed in paragraph [0015]. With respect to new claim 67, support for the same can be found in the specification in paragraphs [0028] and [0029]. With respect to added claim 68, support for the same can be found in Applicant's specification in paragraph [0037].

Applicant's dependent claims should be allowed as depending from allowable base claims, and for their own recited features which are neither shown nor suggested in the cited art. Action to that end is requested.

Respectfully submitted,

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